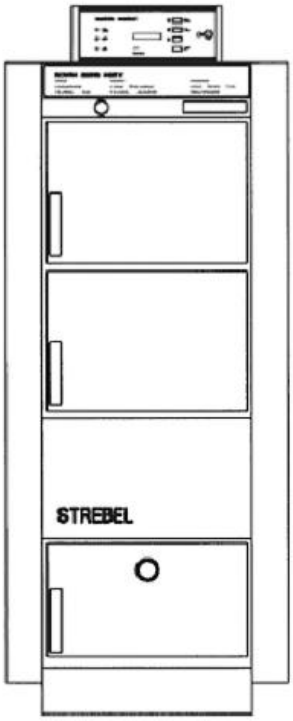
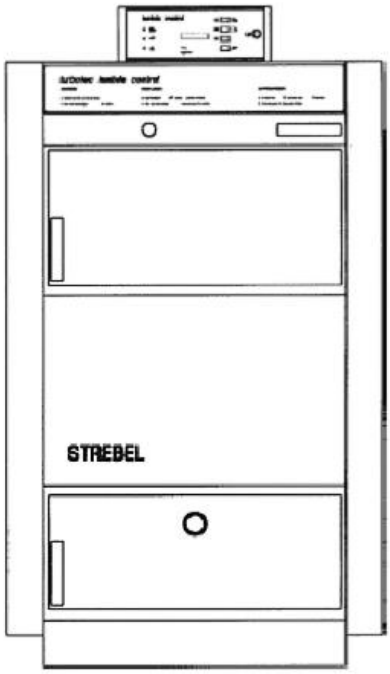
Installation manual
for the authorised specialist

Turbotec lambda control 20-70 kW



20-30, 40S-70



50L & 60 L

11/2014

READ THE INSTRUCTION BOOKLET AND THESE SUPPLEMENTARY INSTRUCTIONS CAREFULLY BEFORE INSTALLATION

These instructions together with those in the instruction booklet cover the basic principles to ensure the satisfactory installation of the boiler, although detail may need slight modification to suit particular local site conditions.
In all cases the installation must comply with current Building Regulations, Local Authority Byelaws and other specifications or regulations as they affect the installation of the boiler.

It should be noted that the Building Regulations requirements may be met by adopting the relevant recommendations given in British Standards BS 8303, BS EN 15287-1:2007 as an alternative means to achieve an equivalent level of performance to that obtained following the guidance given in Approved Document J.

British Standards BS 6700, BS EN 14336:2004: Heating Systems in Buildings. Installation and commissioning of water based heating systems. BS EN 12828: 2003; Heating Systems in Buildings. Design of water based heating systems. BS EN 12831: 2003; Heating Systems in Buildings. Method for calculation of the design heat load. All as applicable to the appliance.

Please note that it is a legal requirement under England and Wales Building Regulations that the installation of the boiler is either carried out under Local Authority Building Control approval or is installed by a Competent Person registered with a Government approved Competent Persons Scheme. HETAS Ltd operate such a Scheme and a listing of their Registered Competent Persons can be found on their website at www.hetas.co.uk.

CO Alarms:-

Building regulations require that when ever a new or replacement fixed solid fuel or wood/biomass appliance is installed in a dwelling a carbon monoxide alarm must be fitted in the same room as the appliance. Further guidance on the installation of the carbon monoxide alarm is available in BS EN 50292:2002 and from the alarm manufacturer's instructions.

Provision of an alarm must not be considered a substitute for either installing the appliance correctly or ensuring regular servicing and maintenance of the appliance and chimney system.

- Wiring to the appliance must be in accordance with the IEE (BS 7671) Wiring Regulations the Health and Safety Document No 635 "The Electricity at Work Regulations 1989" and any local regulations that apply.

HEALTH AND SAFETY PRECAUTIONS

Special care must be taken when installing the boiler such that the requirements of the Health and Safety at Work Act are met.

Handling

Adequate facilities must be available for loading, unloading and site handling.

Fire Cement

Some types of fire cement are caustic and should not be allowed to come into contact with the skin. In case of contact wash immediately with plenty of water.

Asbestos

This boiler contains no asbestos. If there is a possibility of disturbing any asbestos in the course of installation then please seek specialist guidance and use appropriate protective equipment.

Metal Parts

When installing or servicing this boiler care should be taken to avoid the possibility of personal injury.

BOILER PERFORMANCE

Refer to the main instruction further in this manual for details of the boiler's performance.

PREPARATORY WORK AND SAFETY CHECKS

IMPORTANT WARNING

This boiler must not be installed into a chimney that serves any other heating appliance.

There must not be an extractor fan fitted in the same room as the boiler as this can cause the boiler to emit fumes into the room.

Chimney

In order for the boiler to perform satisfactorily the chimney height must be sufficient to ensure an adequate draught of approximately 10 - 15 Pa so as to clear the products of combustion and prevent smoke problems into the room.

NOTE: A chimney height of not less than 4.5 metres measured vertically from the outlet of the boiler to the top of the chimney should be satisfactory. Alternatively the calculation procedure given in EN 13384-1 may be used as the basis for deciding whether a particular chimney design will provide sufficient draught. Ensuring the minimum chimney draught is responsibility of the Chimney specialist appointed.

The outlet from the chimney should be above the roof of the building in accordance with the provisions of Building Regulations Approved Document J.

Because the boiler runs at high efficiencies, the temperature of the flue gases is at times lower than conventional solid fuel appliances. Although it is not classed as a condensing appliance, the low flue gas temperature results in condensation occurring within the flue. Any chimney flue system must therefore be able to withstand the effects of condensate and operate under wet conditions (designation letter W). In addition it should be soot fire resistant and able to withstand the corrosive effects of flue products generated by solid fuels (designation G and 3 respectively). If installation is into an existing masonry chimney then it will require re-lining with a liner meeting the specification described above. Existing concrete or clay lined chimneys are not suitable for this boiler and must be lined as described above. All installations must be in accordance with Building Regulations Approved Document J.

Any existing chimney must be clear of obstruction and have been swept clean immediately before installation of the lining system. Where the chimney is believed to have previously served an open fire installation it is possible that the higher flue gas temperature from a closed appliance may loosen deposits that were previously firmly adhered, with the consequent risk of flue blockage. It is therefore recommended that the chimney be swept a second time within a month of regular use after installation.

If there is no existing chimney then any new system must be to the designation described above and in accordance with Building Regulations Approved Document J.

A single wall metal fluepipe is suitable for connecting the boiler to the chimney but is not suitable for use as the complete chimney. The chimney and connecting fluepipe must have a minimum diameter of 150 mm and its dimension should be not less than the size of the outlet socket of the boiler.

Any bend in the chimney or connecting fluepipe should not exceed 45°. 90° bends should not be used.

Combustible material should not be located where the heat dissipating through the walls of fireplaces or flues could ignite it. Therefore when installing the boiler in the presence of combustible materials due account must be taken of the guidance on the separation of combustible material given in Building Regulations Approved Document J and also in these boiler instructions.

Dear heating installer
and electrician,

The Turbotec central heating boiler has been subjected to type and performance testing by the officially authorised testing bodies Wieselburg, TGM Vienna and TÜV Bavaria. All boilers below 45kW are MCS Approved.

According to the test report, the Turbotec complies with the applicable requirements of EN303-5 for wood fuel.

The Turbotec lambda control is a highly developed product, which is not to be judged by conventional standards and for the installation of which certain special features need to be taken into account. Therefore, we request that you follow the instructions below precisely. Compliance with the installation instructions is a prerequisite for trouble-free operation and guarantee. Please consider that errors during the installation sooner or later can lead to difficulties with approval authorities, to malfunctions or even to damage; i.e. in all cases to customer's complaints. Moreover, subsequent rectification is always more expensive than a proper, careful implementation right from the start. A commissioning protocol was included with the delivery.

It must be our common goal to hand over to the customer a correctly operating, highly efficient system, every unit and part of which functions as expected.

In order to attain this goal, you have to make a very significant contribution – we wish you every success in doing so.

Best regards

Strebel Ltd

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General instructions
Installation, assembly, electrical connections and first commissioning are tasks for a qualified expert. He is responsible for ensuring proper implementation.

Explanation of our warranty conditions.
We have to exclude our warranty for damages occurring due to the following reasons:
- inappropriate or improper use
- incorrect assembly resp. commissioning by the purchaser or a third party, including the fitting of third party parts
- operation of the system with excessive pressure.

The prerequisites for the provision of a warranty are:
- correct operation of the boiler
- operation of the system within the performance limits specified by the manufacturer
- use of suitable fuels.
- the return of the completed commissioning protocol to thermostrom Energietechnik Gesellschaft mbH.

Instruction for the user
The system will retain its safety and functions if it is serviced regularly every year.

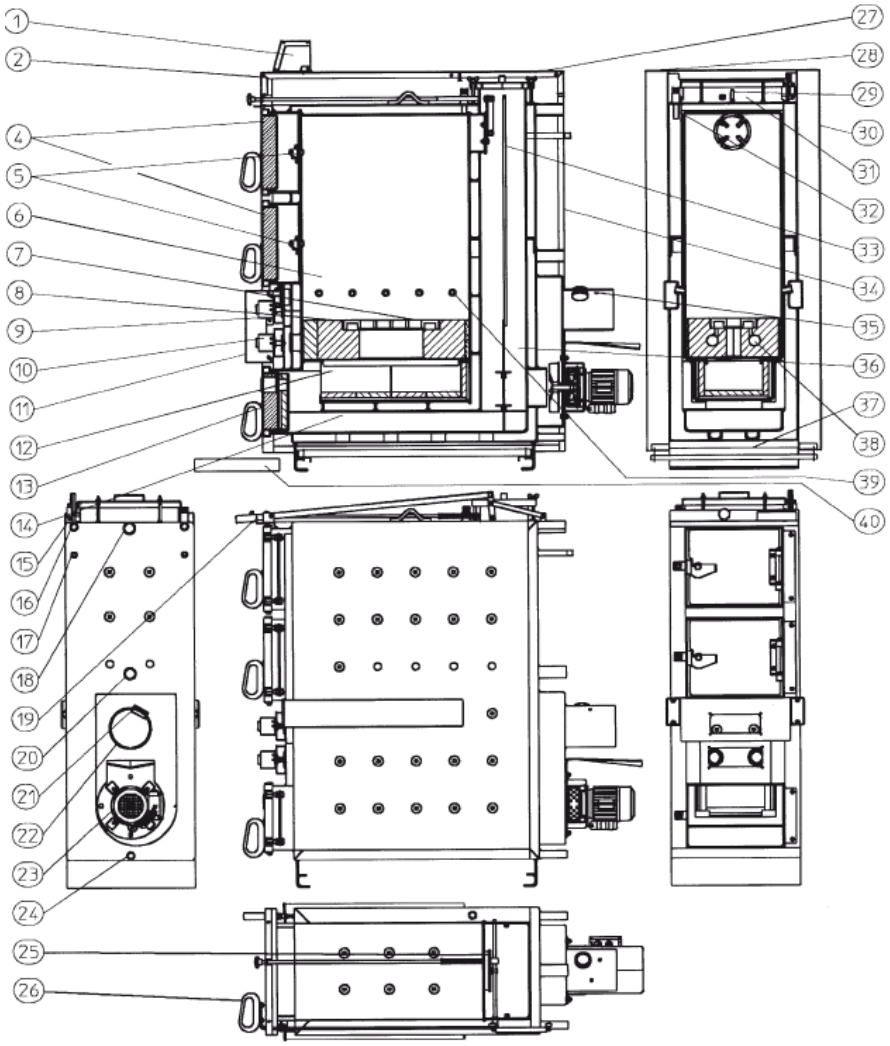
Fields of use
Boilers from the Turbotec series are suitable and approved for use as heat generators in hot water heating systems with a permissible flow temperature of up to 100 °C. They can be installed in open and closed systems according to DIN 4751, sheets 1 and 2, or ÖNORM B 8130 and B 8131.

Scope and method of delivery
Boiler body loose. Cladding with insulation in a carton. Lambda control, storage tank sensor, exhaust fume sensor, O^2 probe, induced draft fan, air regulator units, drip tray, hydraulic unit, return raiser, commissioning protocol, installation and operating manual stowed inside the filling chamber.

Overview

Boiler illustration

tt 20 - 30, 40 S, 50 - 70

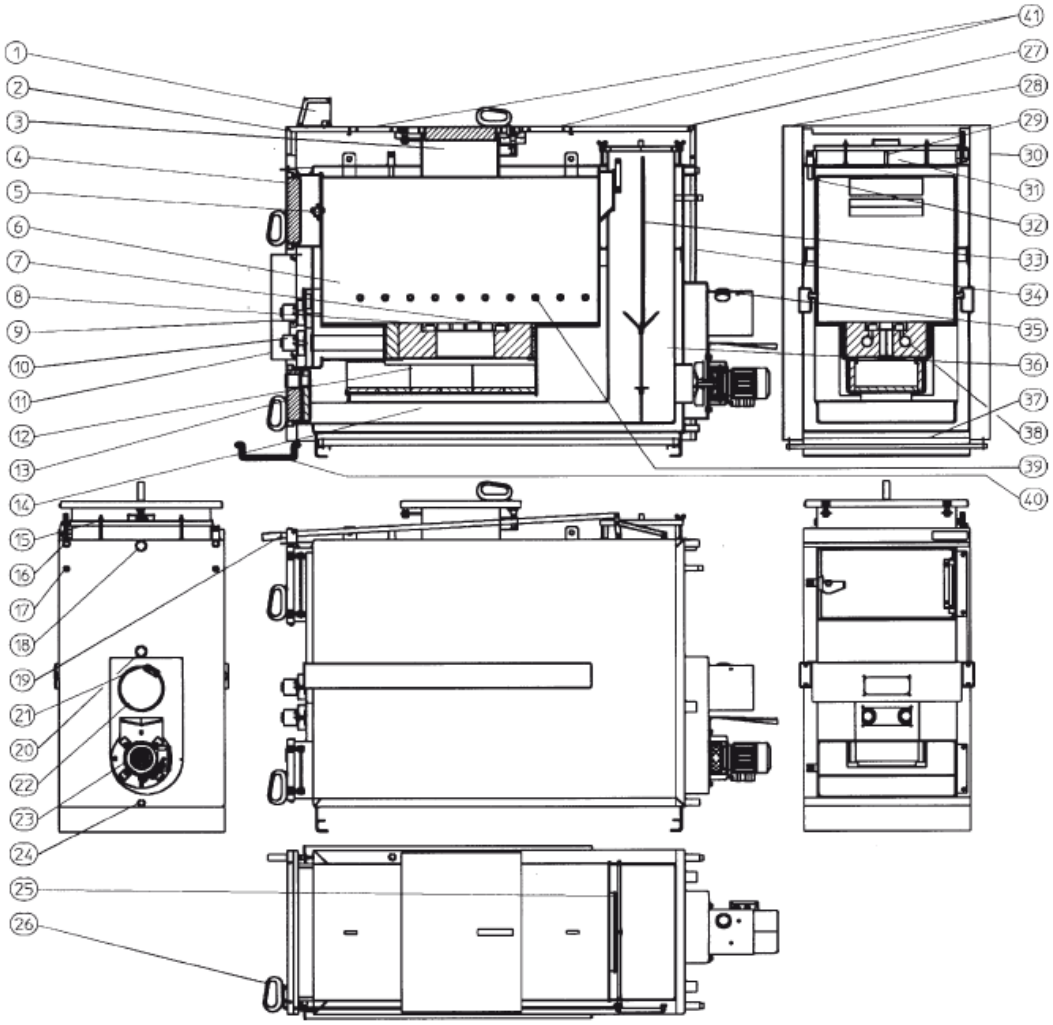


1 Computer-controlled lambda control
2 Cladding, front lid
4 Filling door (type 40S-70has two filling doors)
5 Inner door
6 Filling chamber (fuel storage chamber)
7 Burner grating
8 Burner brick
9 Primary air regulator unit with seal
10 Secondary air regulator unit with seal
11 Cladding, actuator cover
12 Flame duct
13 Ashes door with sight glass
14 Ashes chamber
15 Cleaning lid
16 2 sleeves 1/2”
17 Heat exchanger connection R1/2” for thermal discharge safety device
18 Heating feed connection
19 Opening rod for the gas vent flap
20 Heating return connection
21 Sleeve for O_2 probe
22 Exhaust fume nozzle
23 Induced draft fan
24 Filling and emptying sleeve 1/2"
25 Gas vent flap
26 Opening handle for the gas vent flap
27 Cladding, rear lid
28 Cladding, left side, with plug-in wiring
29 Transport eye bolt
30 Cladding, right side
31 Insulating panel, top
32 Immersion sleeve for STL and boiler temperature sensor
33 Exhaust fume baffle plate
34 Cladding, rear side
35 Thread for exhaust fume sensor
36 Ancillary heating surface
37 Cladding, base
38 Secondary air apertures
39 Primary air apertures
40 Drip tray

Overview

Boiler illustration

tt 60 L, 50 L and tt 40 (analogous)



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35 Thread for exhaust fume sensor
36 Ancillary heating surface
37 Cladding, base
38 Secondary air apertures
39 Primary air apertures
40 Drip tray

Overview

Boiler technical data

Boiler			Type 20	Type 25	Type 30	Type 40	Type 40S	Type 50	Type 60	Type 70	Type 50L	Type 60L
	Filling doors H/W (2x for 40S-70)	cm	60/34	60/34	60/34	36/54	36/54	36/54	36/54	36/54	36/54	36/54
	Flow /return	F/R	5/4"	5/4"	5/4"	5/4"	5/4"	5/4"	5/4"	5/4"	5/4"	5/4"
	Drain	D	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1"	1"
	Safety heat exchanger	HE	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
	Filling lid height/width	cm	–	–	–	–	–	–	–	–	36/54	36/54
	Weight	kg	515	515	515	710	925	925	925	925	940	940
	Transport width	cm	50	50	50	69	69	69	69	69	69	69

General operating data	Rated heating power	kW	20	25	30	40	40	50	60	70	50	60
	Max. operating overpressure	bar	3	3	3	3	3	3	3	3	3	3
	Permissible feed temperature	°C	100	100	100	100	100	100	100	100	100	100
	Min. return temperature	°C	55	55	55	55	55	55	55	55	55	55
	Qmin. (SWT)	litres/h	600	600	600	1000	1200	1200	1200	1200	1200	1200
	Δp (20K)	mbar	0.57	0.89	1.3	2.3	2.3	3.6	5.2	7.1	3.6	5.2

Power and emission data at tested rated power	Exhaust fume temperature	°C	158	160	163	169	169	176	183	191	167	186
	CO2 content	%	15	15	15	15	15	15	15	16	17	17
	CO (at 13% O2)	mg/Nm^3	93	109	124	155	155	147	140	132	250	153
	Solids emission (dust)	mg/Nm^3	15	15	14	14	14	18	23	27	15	17
	Boiler efficiency	%	91	90.8	90.6	90.1	90.1	90.2	90.4	90.5	89.8	90

Contents	Boiler water capacity	litres	115	115	115	210	255	255	255	255	370	370
	Filling chamber volume	litres	150	150	150	190	290	290	290	290	340	340
	Filling chamber depth	cm	60	60	60	60	60	60	60	60	110	110
	Combustion duration	approx. hrs.	7	6	5	5	8	7	6	5	8	6

Storage tank volume	Minimum Volume Recommended by Strebel	litres	1200	1500	1800	2400	2400	3000	3600	4200	3000	3600

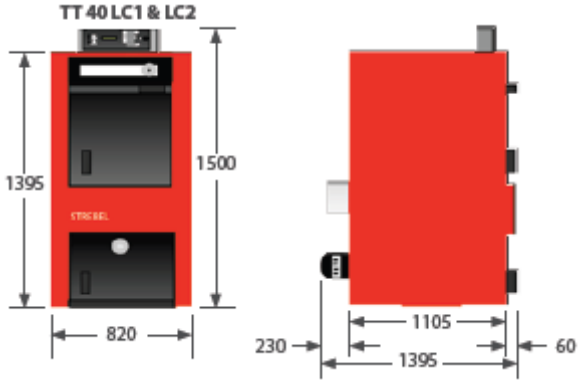
Flue	Required outlet pressure	mbar	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10
	Exhaust fume mass flow rate	g/s	15	19	23	30	30	39	46	54	39	45
	Diameter of exhaust nozzle	cm	15	15	15	18	18	18	18	18	18	18

The manufacturer's tables are authoritative for the dimensioning of the flue. Austria/Germany: in the case of existing systems, the flue must be inspected by a master chimney sweep! UK & Eire: the chimney must be swept as per local regulations.
Strebelwerk GMBH reserve the right to change any data without prior notice.

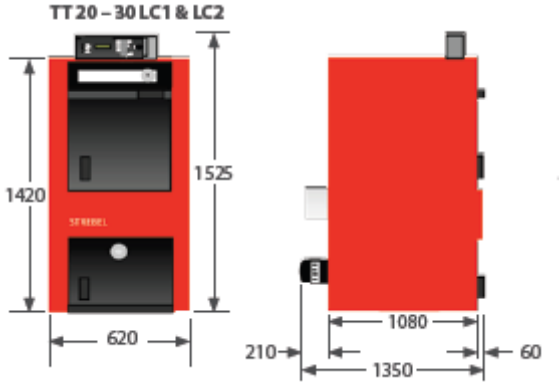
Overview

Boiler dimensions

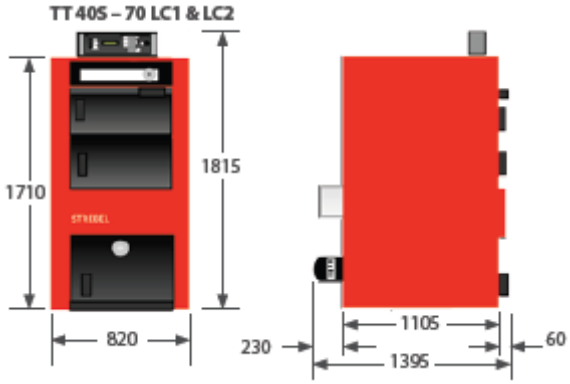
Turbotec 40 lambda control



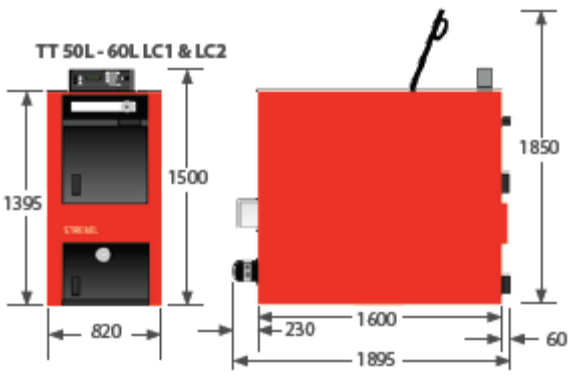
Turbotec 20 – 30 lambda control



Turbotec 40S – 70 lambda control



Turbotec 50L – 60L lambda control (Showing optional filling lid centre line)



Overview

Control technical data

Mains power supply	230V +10/-15% / 50Hz
Power consumption, electronics	max. 30VA at 230V
Maximum current consumption, entire system	Imax = 6.3 A
Fuse use	5 x 20 mm / 6.3 A quick-blow
Switch-off temperature of the safety temperature limiter	T = 100 °C +0 / -5%
Heating circuit pump	Switching output: 230 V / max. 1.5 A
Charge pump for tap water storage tank	Switching output: 230 V / max. 1.5 A
Actuator drive for charge valve	Switching output: 230 V / max. 0.1 A
Induced draft fan	Switching output: 230 V / max. 1.5 A
Primary pump	Switching output: 230 V / max. 1.5 A
Actuator drive for return valve	Switching output: 230 V / max. 0.1 A
Floating switchover contact	Contact load: 230 V / max. 5 A
Control outputs for air regulator units	0 to 10 V / max. 3 mA
Power supply output for air regulator units	AC voltage output: 24 V / 6 VA
Electromagnetic door opener	AC voltage output: 12 V / 16 VA
Power supply output for O_2 probe	AC voltage output: 12 V / 16 VA
Measurement input for Pt100 (R=108/20°C) - Storage tank sensor - boiler sensor - exhaust fume sensor	Maximum sensor temperature: Tmax = 150°C Tmax = 150°C Tmax = 600°C
Immersion sleeve for boiler sensor and safety temperature limiter	2x LW7 with cable ties Ms63, PN16, immersion depth 100
Protection class	IP 40 (appliance detached: IP 00)
Ambient operating temperature	0 °C to +50 °C
Ambient storage temperature	–20 °C to +70 °C

There are several controllers available in the Strebel Turbotec boiler range, each with their own special features. These controllers DO NOT alter the performance of the appliance, only supplementing system/control outputs. Covered in this manual is LC1.

	LC-E	LC1	LC1 BSB	LC2 BSB
Fully Insulated Steel Body	√	√	√	√
Full Digital Controller	√	√	√	√
Lambda Controlled Combustion	√	√	√	√
Electronic Door Solenoid	#	√	√	√
Heat Exchanger Cleaning	#	#	#	#
Thermal Control of Y1 & Y2 Valves	√			
Electrical Control of Y1 & Y2 Valves		√	√	√
Remote Refuelling Signal		√	√	√
Full Electronic Control of Thermal Store Temperature		√	√	√
Large Multiline Display			√	√
Optimising Parameters for Type of Wood and Water Contend		√	√	√
Optimising of the Ignition and Burn off Situation in the Boiler		√	√	√
Automatic Ignition			#	#
Control of Single Heating Circuit (Weather Compensated)			√	√
Control of Two Heating Circuit (Weather Compensated)			#	√
Living Room Control			#	√
Hot Water control				√
Integration of Thermal Solar Control			#	√
Automatic Switch on of Backup Boiler		√	√	√

√ Standard
Optional Extra's

Overview

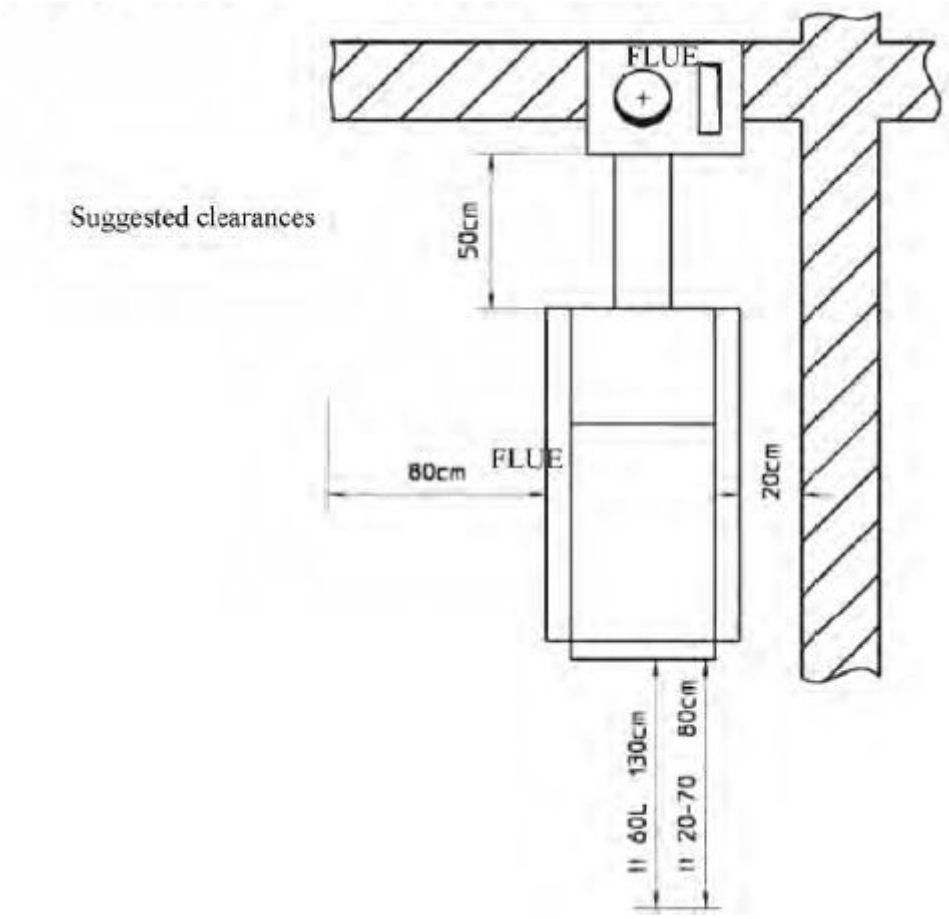
Boiler room/air supply/installation site Checks following transport

Boiler room
With regard to the equipment in the boiler room, the respective local building regulations, the applicable standards and fire ordinances as well as fire protection regulations are authoritative. The installation room must be frost-proof and well ventilated. Any damage to the boiler which occurs if these requirements are not met, will not be covered by the warranty.

Air supply
It must be ensured that there is an adequate supply of fresh air to the boiler room, so that the combustion air required for the operation of the installed burners, can be replaced and the operating personnel are not endangered by a lack of oxygen! The supply air must not be contaminated by aggressive vapours (e.g. hairspray, percholoroethylene, carbon tetrachloride).

Installation site
The boiler must be installed levelly on a fortified floor. A plinth is not required. For unhindered operation and maintenance of the boiler unit, it must be ensured that there is a passage width of at least 80cm (type 20-70) / 130cm (type 60 L) in front of and on at least one side of the boiler, and at least 50 cm behind the boiler.
On the top side of the boiler, at the back, there is a cleaning aperture.. Therefore, the ceiling clearance must be at least 60 to 80cm. Do not lay any pipes in the vicinity of the cleaning lid (15)!

Checks following transport
Attention must be paid to the following points after transport into the boiler room and before commencing assembly:
- position of the lining stones in the flame duct (12)
- position of the insulating stones in the ashes door (13)
- sealing integrity of the doors; the doors are adjustable on both the hinge and closure sides
- remove all components from the filling chamber, check them against the packing list and lay them out ready for assembly.

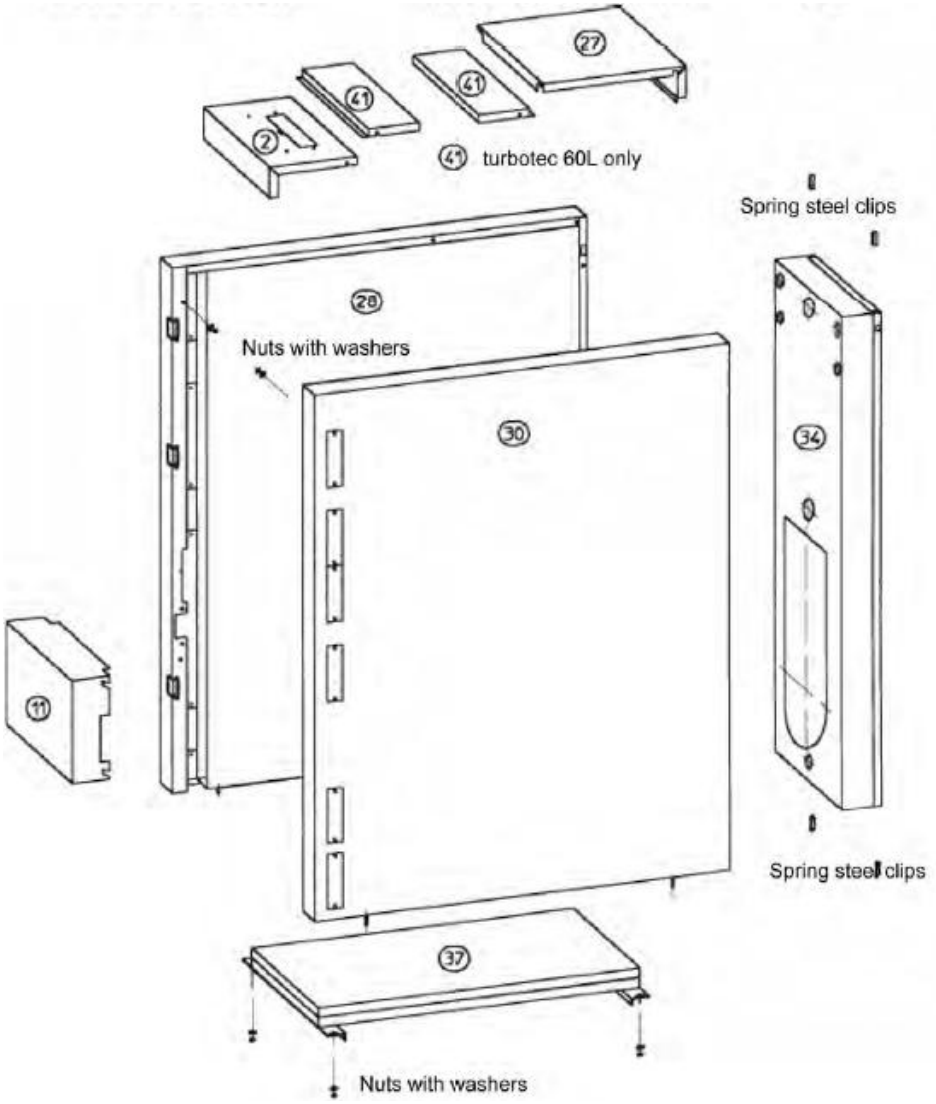


Assembly

Assembly of the cladding with insulation

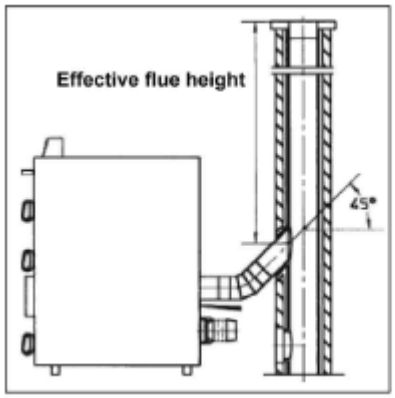
Assembly of the cladding with insulation

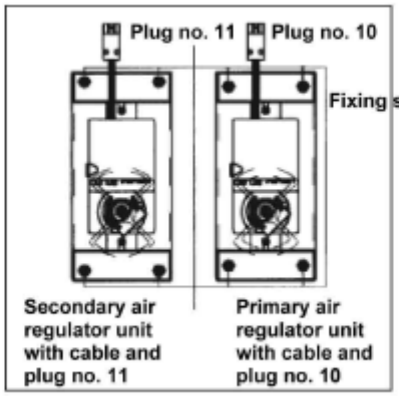
- Place the rear side cladding (34) over the exhaust fume nozzle onto the boiler.
- Slide in the base cladding (37).
- Hook the side claddings (28, 30) into the slots in the base cladding (37) with the welded-on bolts and fasten at the top, but do not tighten yet.
- Release the cable loom with the plug out of the left side cladding (28) for attachment to the control later.
- Connect the rear side cladding (34) to the side claddings (28, 30) using spring steel clips and self-tapping screws.
- Place the top insulating plate (31) on top of the boiler.
- Hook in the front lid cladding (2).
- Adjust the heights of the side claddings (28, 30) using the knurled nuts so that the front edge of the side cladding (28, 30) aligns with the doors at the front.
- Unhook the front lid cladding (2), tighten the side claddings (28, 30) at the top and bottom and hook in the front lid cladding again.
- Lay ready the actuator cover cladding (11), the rear lid cladding (27) and, in the case of type 60 L, the cover panels (41).

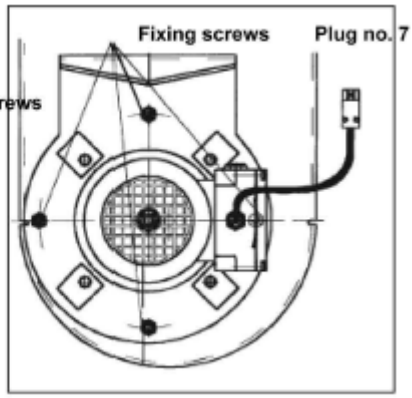


Assembly

Flue / mounting the air regulation units
Mounting the induced draft fan
Electrical / Water connection / heating connections




Plug no. 11
Plug no. 10
Fixing screws
Secondary air regulator unit with cable and plug no. 11
Primary air regulator unit with cable and plug no. 10



Flue
The flue must be checked by the responsible master chimney sweep before the heating boiler is installed. The suitability of the flue must be confirmed, together with the findings. A flue which conforms to regulations and is correctly dimensioned for the boiler power according to DIN 4705, is a prerequisite for the proper and economical operation of the heating system (see picture for a classic example). The exhaust fume values are to be taken from the 'Boiler technical data' sheet. If neither a high thermally insulated flue (heat conductivity resistance group I according to DIN 18160 T1), nor a building authority approved exhaust fume system is used, the minimum exhaust fume temperature can be limited to, or set at 160 °C via the control. The exhaust fume pipe between the boiler and the flue must be **absolutely airtight** and **insulated**, since otherwise the induced draft fan can blow exhaust fumes and ashes into the boiler room through leaks when the flue is cold. To assist with pressure fluctuations, it is recommended to fit a draft stabiliser.

Mounting the air regulation units
Fasten the primary and secondary air regulator units including the seals provided, to the boiler, as shown in the diagram.
Connect the plugs to the connector strip at the front and hook in the actuator cover (11).
Caution: Never separate the air regulator flap and the actuator from each other!

Mounting the induced draft fan
Fasten the induced draft fan to the boiler using four nuts as shown in the diagram and connect the plug to the connector strip at the rear.

Electrical connections

The installation of any electrical services during the installation of this boiler and the associated heating system must be carried out by a registered competent electrician and in accordance with the requirements of the latest issue of BS 7671.

Water connections

Filling and draining
A 1/2" sleeve (24) is provided on the rear side of the boiler for the filling and draining cock.

Heating connections
Boilers from the Turbotec range have the flow and return connections (18, 20) on the rear side of the boiler.
Caution: The O_2 probe and the exhaust temp sensor must be installed in the exhaust pipe; it is essential to keep this place free from pipework!

The water system must be suitably vented & inhibitor used when filling and a double-feed indirect cylinder to the current issue of BS 1566, Copper indirect cylinders for domestic purposes, Part 1Specification for double feed indirect cylinders is necessary where there is a combined hot water and central heating system. There is no requirement for a gravity heat-leak radiator or towel rail to dissipate heat when the pump is off due to the buffer vessel and boiler thermal loss able to compensate this.

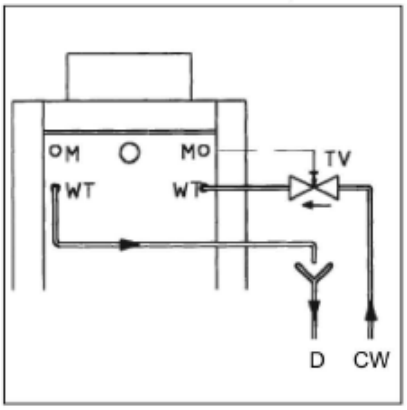
Assembly

Raising the return temperature
Thermal discharge safety device
Mounting the O_2 probe and the exhaust fume sensor

Raising the return temperature
The installation of a hydraulic unit is mandatory in boilers from the Turbotec series, since without a hydraulic unit the regulatory behaviour of the boiler does not proceed correctly in combination with the lambda control. In general, operating temperatures which are too low shorten the service life of a boiler considerably. Especially in the area of the water-cooled ancillary heating surfaces, where the exhaust fumes temperatures are already relatively low, the water vapour in the exhaust fumes will condense if the temperature falls below the dew point. This condensate causes corrosion, hence shortening the service life of the boiler.
Corrosion due to the formation of condensate is avoided in Turbotec boilers by the following measures:
- the feed temperature is maintained at a high level by the lambda control.
- The return temperature is maintained above the dew point by the mandatory hydraulic unit (see hydraulic unit).

Thermal discharge safety device
In heating systems according to DIN 4751 sheet 2, solid fuels may only be fired if the boilers are equipped with a suitable safety heat exchanger and a type-tested ‘thermal discharge safety device’. The two 1/2" threaded nozzles (17) of the safety heat exchanger are located at the rear side of the boiler and can be used optionally as water inlet or water outlet.
The safety heat exchanger may not be used under any circumstances as an operational water heater! The ‘thermomechanical valve’ must be connected, non-isolatable, to the water supply network, observing the direction of flow.
The cold water preliminary pressure must be at least 2 bar!
The response temperature of the thermomechanical valve must not exceed 100 °C. The safety heat exchanger and the thermal discharge safety device must be serviced and checked annually by an expert.

TV = thermomechanical valve
M = ½” sleeve for valve probe
D = drain
CW = cold water



It is essential to mount a funnel and drain pipe for the ‘thermal discharge safety device’ – no water must be allowed to flow onto mounted electrical devices!!

Mounting the O_2 probe and the exhaust fume sensor
- Mount the exhaust fume sensor on the exhaust fume nozzle and connect the plug to the connector strip at the appropriate position (see plug designation number).
- Screw the protective tube with the pre-mounted O_2 probe into the sleeve (21) on the exhaust fume nozzle (the thread of the protective tube is already wrapped with Teflon tape) and connect the plug to the connector strip at the appropriate position (see plug designation number).

Mounting the storage tank sensor
Mounting the hydraulic unit
Mounting the control

Mounting the storage tank sensor
- Insert the storage tank sensor into the immersion sleeve on the storage tank and connect the plug to the connector strip at the appropriate position (see plug designation number).

Mounting the hydraulic unit
In order to raise the return temperature and to ensure the proper regulatory behaviour of the boiler, it is mandatory to install the following hydraulic unit.
The hydraulic unit should be installed to the left or right coming from the boiler or immediately after the boiler in the heating feed pipe.
The following guide values must be maintained when setting the 3-stage rotational speed switch on the pump:

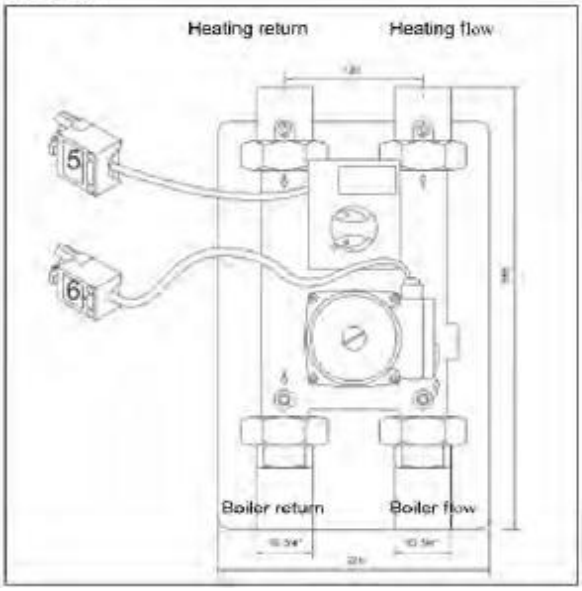
Boiler type	Pump, e.g. Wilo	Rotational speed stage
20	EAS 30/6-3	1
25	EAS 30/6-3	2
30	EAS 30/6-3	3
40	EAS 30/6-3	3
40 S	TOP-S30/7	1
50	TOP-S30/7	1
60	TOP-S30/7	2
70	TOP-S30/7	3
50 L	TOP-S30/7	2
60 L	TOP-S30/7	2

In all cases the rotational speed switch should be set in such a way that a temperature difference of 10 – 15 °C is achieved between the boiler feed and return.

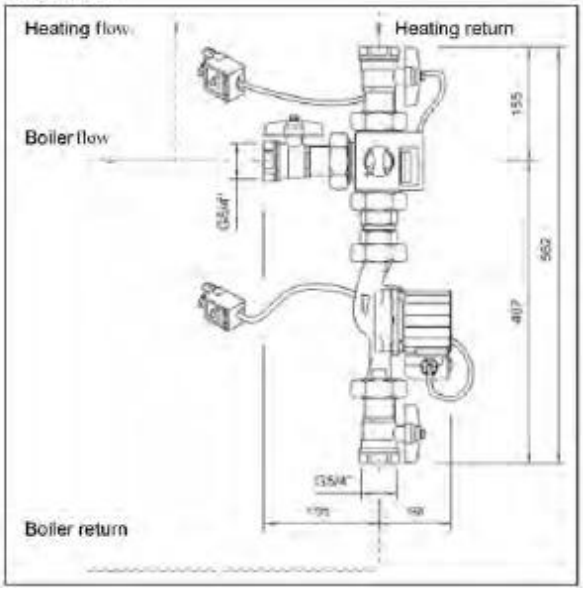
The actuator on the 3-way valve has an electrical end position power-off switch and can become defective if operated manually.

Mounting the control
- Lay the lid cladding (2) on the boiler and support it on the right side cladding.
- Unpack the control,carefully, unroll the capillary tube of the safety temperature limiter (don't bend it!) and push it through the recess in the lid.
- Insert the sensor of the safety temperature limiter and the boiler sensor into the boiler immersion sleeve. The sensors must be secured using the cable ties provided in order to prevent them being accidentally pulled out.
- Thread the pre-wired terminal strip from below through the recess in the lid (2) and plug it into the control in the correct position (see label on the control).
- Connect the protective earth cable to the boiler lid using the spade connector. **Check that the boiler protective earth cable is connected correctly!**
- Connect the plug for the mains connection and boiler protective earth cable.
Check that the boiler protective earth cable is connected correctly!
- Mount the control on the lid (2) using the four screws provided.
- Hook in the cover plates (41) if the boiler is a type 60 L.
- Hook in the lid cladding (2) and additionally the rear lid cladding (27).

HG20-40



HG40S-70



Assembly

Hydraulic diagrams Overview

The following possibilities to configure the system are stored in the lambda control. Systems 3 and 3.1 are described in detail in this installation manual.
If you wish to use a different hydraulic system and you do not yet have the corresponding documents, we kindly ask you to request them by phone at the following number 0043-7252 / 382 71.

Brief description of systems 1 to 5

System 1:
Monovalent system with or without tap water storage tank

Control of tap water temperature
Manual or automatic heating regulation with minimum heat consumption
Heating release
Winter or summer function selectable by customer

System 2:
Bivalent system with or without tap water storage tank

Control of the tap water temperature by the lambda control or the control of the oil or gas boiler
Heating regulation of the oil or gas boiler with minimum heat consumption
Forced heat consumption before the boiler switches to standby
Automatic continuation of operation in the case of an alternative operating mode

Systems 3 and 4:
Monovalent or bivalent system with buffer storage tank and charging valve

Dimensioning of the boiler power according to the calculated heating needs
Heating priority (startup relief by means of bypassing the buffer)
Intelligent buffer storage tank management (buffer charging priority depends on set boiler temperature)
Residual heat withdrawal down to minimum boiler temperature (differential control)
Signal to add fuel if the storage tank temperature falls below the minimum

SYSTEM 5:
Monovalent or bivalent system with buffer storage tank (charging valve optional)

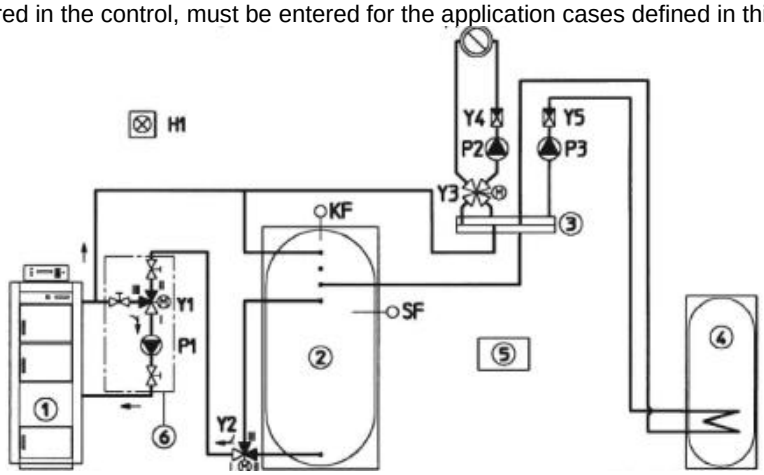
Constant temperature control through controlled return temperature of the solid fuel boiler
Control of the return temperature of an oil or gas-fired boiler in bivalent systems with automatic continuation of operation
All storage tank connection variants
Residual heat withdrawal through minimum boiler temperature
Signal to add fuel if boiler burns out (automatic continuation of operation)
Additional function with charging valve
Dimensioning of the boiler power according to the calculated heating needs
Heating priority (startup relief by means of bypassing the buffer)
Intelligent buffer storage tank management (buffer charging priority depends on set boiler temperature)

- Wiring to the appliance must be in accordance with the IEE (BS 7671) Wiring Regulations the Health and Safety Document No 635 "The Electricity at Work Regulations 1989" and any local regulations that apply.

Assembly

Hydraulic diagram – system 3
Electrical connection diagram

System no. 3, which is stored in the control, must be entered for the application cases defined in this installation manual.



Key

1 Turbotec wood gas boiler
2 Load compensation storage tank, buffer storage tank or energy storage tank
3 Heating distributor
4 Tap water storage tank
5 Heating circuit and tap water control
6 Hydraulic unit

Y1 Return valve with actuator
Y2 Charging valve with actuator
Y3 Four-way valve with actuator
Y4 Non-return valve or flap
Z5 Non-return valve or flap
SS Storage tank sensor (lambda control)
BS Boiler sensor for the heating circuit and tap water control

P1 Primary pump
P2 Heating circuit pump
P3 Charging pump, tap water storage tank
H1 Remote indicator ‘Add fuel’

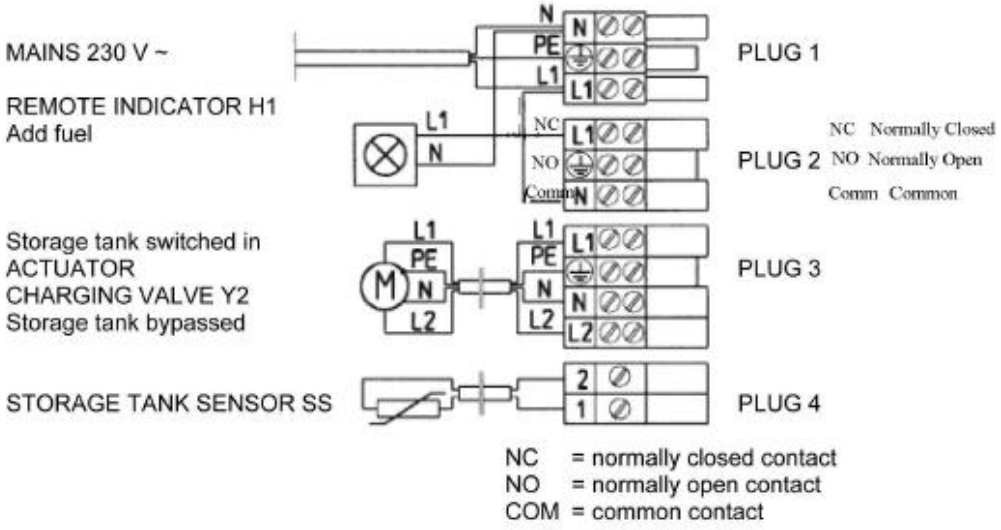
Position Y2:

Storage tank bypassed (0)

Storage tank switched in (1)

Important instruction:

Stop valves, vents and technical safety measures are not shown in this block diagram. These must be installed system-specifically in accordance with standards and regulations.



The electrical installation of the boiler system, including all control and safety devices, may only be performed by a qualified electrician. The relevant national regulations (Germany: VDE DIN 57116 Electrical Equipment of Combustion Plants; Austria: ÖVE 0116) and the Technical Connection Conditions) of the electricity supply company must be complied with.

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Assembly

System 3
Functional description
Important information

System 3
Turbotec wood gas boiler with load compensation, buffer or energy storage tank, tap water storage tank, weather guided heating circuit and tap water control.

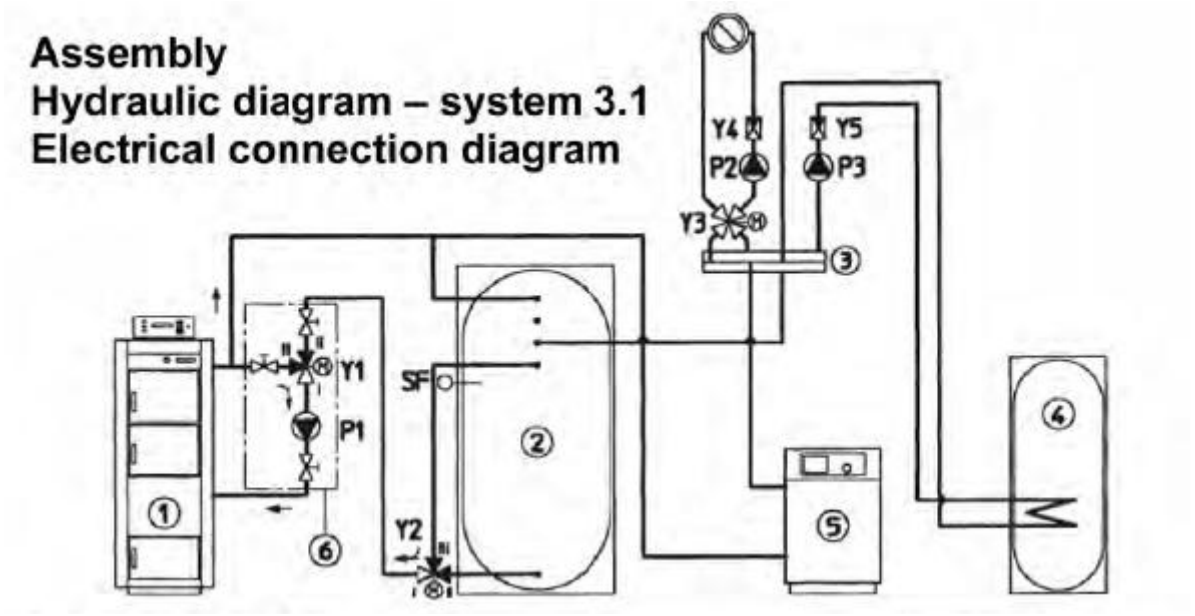
Functional description System 3
If the heating is switched on on the Turbotec,
- the remote indicator H1 goes out.
- If the boiler temperature reaches 50 °C, the primary pump P1 switches on and the return temperature of the Turbotec is raised via the return valve Y1.
- From a boiler temperature of 55 °C, the return valve Y1 opens (the return temperature continues to be raised) and heat is discharged to the upper part of the load compensation, buffer or energy storage tank.
- Once the minimum temperature has been reached at the boiler sensor BS of the heating circuit and tap water control system, the charging of the tap water storage tank takes place according to the program and heat is discharged to the heating system.
- From a boiler temperature of 72 °C, and depending on the heat consumption and the target boiler temperature that has been set, the load compensation, buffer or energy storage tank is switched in and charged accordingly.
- If the fuel is exhausted, the heating is switched off. The residual heat from the boiler is fed into the load compensation, buffer or energy storage tank depending on the temperature difference (between the boiler temperature and the storage tank temperature). Once the boiler temperature has fallen below the minimum value Tkmin (can be set in the installer menu), the withdrawal of heat from the boiler is ended.
- The stored heat can now be discharged to the heating system or the tap water storage tank, as required.
- Once the temperature in the load compensation, buffer or energy storage tank falls below the minimum value TSmin (can be set in the installer menu), the remote indicator H1 lights up.
- Once the temperature at the boiler sensor BS of the heating circuit and tap water control system falls below the minimum value, the discharge of heat to the heating system or tap water storage tank is ended.

Important instruction:

The setting of a **boiler temperature TK S of 85 °C causes the load compensation, buffer or energy storage tank to be charged at the same time as heat is discharged to the heating system.**
The storage charging valve Y2 begins to open from a boiler temperature TK I of 72 °C. In other words, the boiler output is only reduced after the load compensation, buffer or energy storage tank has been charged.
The setting of a **boiler temperature TK S of 70 °C causes the load compensation, buffer or energy storage tank to be charged only after the produced boiler output is no longer consumed by the heating system.** The boiler temperature will therefore continue to increase and the storage charging valve Y2 begins to open from a boiler temperature TK I of 72 °C. In other words, the boiler output is reduced before the load compensation, buffer or energy storage tank has been charged.

- Wiring to the appliance must be in accordance with the IEE (BS 7671) Wiring Regulations the Health and Safety Document No 635 "The Electricity at Work Regulations 1989" and any local regulations that apply.

Assembly
Hydraulic diagram – system 3.1
Electrical connection diagram



Key

1 Turbotec wood gas boiler
2 Load compensation storage tank, buffer storage tank or energy storage tank
3 Heating distributor
4 Tap water storage tank
5 Oil or gas-fired boiler
6 Hydraulic unit

Y1 Return valve with actuator
Y2 Charging valve with actuator
Y3 Four-way valve with actuator
Y4 Non-return valve or flap
Z5 Non-return valve or flap
SS Storage tank sensor (lambda control)

P1 Primary pump
P2 Heating circuit pump
P3 Charging pump, tap water storage tank

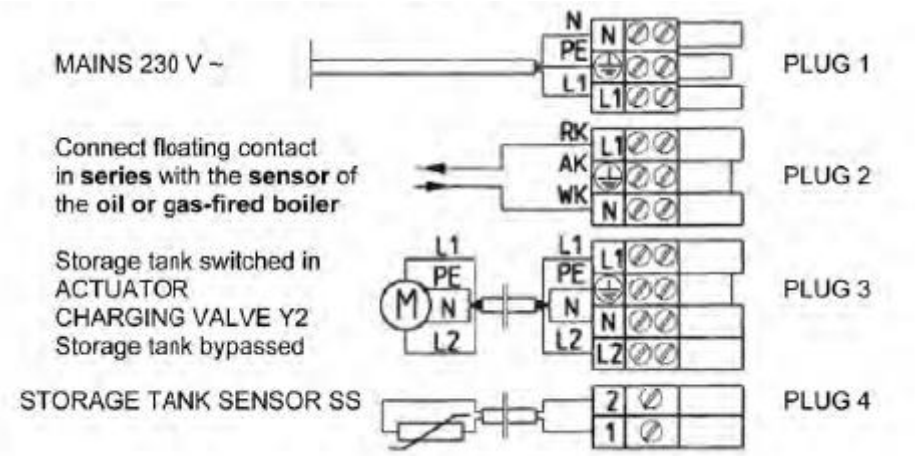
Position Y2:

Storage tank bypassed (0)

Storage tank switched in (1)

Important instruction:

Stop valves, vents and technical safety measures are not shown on this block diagram. These must be installed system-specifically in accordance with standards and regulations. In the case of operation with one flue, an approved exhaust fume temperature monitor (DIN 3440) must be fitted to the Turbotec and switches mounted on the doors and in the control chain of the oil and gas-fired boiler.



The electrical installation of the boiler system, including all control and safety devices, may only be performed by a qualified electrician. The relevant national regulations (Germany: VDE DIN 57116 Electrical Equipment of Combustion Plants; Austria: ÖVE 0116) and the Technical Connection Conditions) of the electricity supply company must be complied with.

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Assembly

System 3.1
Functional description
Important information

System 3.1
Turbotec wood gas boiler with load compensation, buffer or energy storage tank, tap water storage tank, oil or gas-fired special boiler, weather guided heating circuit and tap water control system

Functional description
System 3.1
If the heating is switched on on the Turbotec,
- the oil or gas-fired burner is switched off. The functions of the weather-guided heating circuit and tap water control system are retained.
- If the boiler temperature reaches 50 °C, the primary pump P1 switches on and the return temperature of the Turbotec is raised via the return valve Y1.
- If the boiler temperature in the Turbotec reaches 55 °C, the return valve Y1 opens (the return temperature continues to be raised) and, through the weather-guided heating circuit and tap water control system, the heat is discharged to the heating system resp. to the tap water storage tank.
- From a boiler temperature of 72 °C, and depending on the heat consumption and the target boiler temperature which has been set, the load compensation, buffer or energy storage tank is switched in and charged accordingly.
- If the fuel is exhausted, the heating is switched off. The residual heat from the boiler is fed into the load compensation, buffer or energy storage tank depending on the temperature difference (between the boiler temperature and the storage tank temperature). Once the boiler temperature has fallen below the minimum value Tkmin (can be set in the installer menu), the withdrawal of heat from the boiler is ended.
- The stored heat can now be discharged to the heating system or the tap water storage tank, as required.
- Once the temperature in the load compensation, buffer or energy storage tank falls below the minimum value TSmin (can be set in the installer menu), the oil or gas-fired burner is released and can be put into operation, depending on the weather-guided heating circuit and tap water control system.

Important instruction:
The setting of a **boiler temperature TK S of 85 °C causes the load compensation, buffer or energy storage tank to be charged at the same time as heat is discharged to the heating system**. The storage charging valve Y2 begins to open from a boiler temperature TK I of 72 °C. In other words, the boiler output is only reduced after the load compensation, buffer or energy storage tank has been charged.
The setting of a **boiler temperature TK S of 70 °C causes the load compensation, buffer or energy storage tank to be charged only after the produced boiler output is no longer consumed by the heating system**. The boiler temperature will therefore continue to increase and the storage charging valve Y2 begins to open from a boiler temperature TK I of 72 °C. In other words, the boiler output is reduced before the load compensation, buffer or energy storage tank has been charged.
If both boilers are operated with one chimney, an approved exhaust fume temperature monitor (DIN 3440) must be fitted to the Turbotec in addition to a switch on each door so that, at an exhaust fume temperature of 80 °C on the Turbotec or upon the opening of one of its doors, the oil/gas-fired boiler will be switched off immediately.

- Wiring to the appliance must be in accordance with the IEE (BS 7671) Wiring Regulations the Health and Safety Document No 635 "The Electricity at Work Regulations 1989" and any local regulations that apply.

Assembly

Settings for system 3

Settings for system 3
Once the electrical connection for System 3 has been made and the control has been mounted, the main heating switch on site can be switched on. This activates the electricity supply and the following appears on the display:

Code input	+ -
###	<--

Pressing the ‘Plus’ button causes the displayed code number (random number) to be incremented by 1 (installer setting menu = code + 1).
The code number is confirmed by pressing the ‘Arrow’ button, one arrives in the installer setting menu and the following appears on the display:

Language	+ -
[D]	<--

The desired language for the text display is selected via the ‘Plus’ and ‘Minus’ buttons.
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display:

Boiler type	+ -
Turbotec 20	<--

The corresponding boiler type is selected via the ‘Plus’ and ‘Minus’ buttons.
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display:

System	+ -
No.: 0	<--

The desired System 3 is selected by pressing the ‘Plus’ button.
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display:

Are you sure ?	
NO – YES	<--

The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display:

Storage tank sensor	+ -
YES	<--

The ‘Plus’ or ‘Minus’ button is pressed to select whether or not a storage tank sensor is present.
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display (only if a storage tank sensor is present):

Storage tank sensor	+ -
length in m 8	<--

If the factory-specified length of the storage tank sensor cable has to be changed due to structural reasons, the actual cable length can be entered by pressing the ‘Plus’ or ‘Minus’ button so that correctly measured values will be obtained (max. cable length 50 metres, cable cross-section 2 x 0.75 mm^2).
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display (only if a storage tank sensor is present):

Storage tank min.	+ -
TSmin [°C] 45	<--

The minimum temperature in the load compensation, buffer or energy storage tank is selected by pressing the ‘Plus’ or ‘Minus’ button. If the temperature falls below the set temperature, the ‘Add fuel’ indicator is activated and, in the case of bivalent operation, the oil or gas burner is released for operation.
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display:

Boiler min.	+ -
TKmin [°C] 60	<--

The minimum boiler temperature down to which residual heat is withdrawn from the boiler, is selected by pressing the ‘Plus’ or ‘Minus’ button.
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display:

Exhaust fume temp. min. + -	
TAmin [°C] 100	<--

The minimum exhaust fume temperature required for the flue, is set by pressing the ‘Plus’ or ‘Minus’ button (the flue manufacturer or chimney sweep’s specifications must be observed).
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display:

Return valve	+ -
[sec] 150	<--

The running time of the return valve actuator is set by pressing the ‘Plus’ or ‘Minus’ button.
The entry is confirmed by pressing the ‘Arrow’ button, one arrives at the next setting and the following appears on the display:

Charging valve	+ -
[sec] 150	<--

The running time of the charging valve actuator is set by pressing the ‘Plus’ or ‘Minus’ button.
The entry is confirmed by pressing the ‘Arrow’ button.
All of the previously set values are now stored in the control.
The installer settings menu is now abandoned.

Table for noting system settings
Aggregate test

The control has now been set up for the existing system and is ready for operation. The set values can be changed at any time in the installer settings menu.
The set values should be noted in the following table so that they are available if service is required.

Table for noting system settings

Customer name	
Street	
Town/postcode	
Tel. no.	

Language	
Boiler type	
System no.	
Storage tank sensor	
Storage tank sensor length in [m]	
Minimum storage tank temp. Tsmin [°C]	
Minimum boiler temp. TKmin [°C]	
Minimum exhaust fume temp. TAmin [°C]	
Return valve running time [sec]	
Charging valve running time [sec]	

Aggregate test
Only possible in the operating mode 'Heating OFF'.
For safety reasons, the aggregate test may only be carried out when there is no fuel in the boiler.
The following appears on the text display:

Heating OFF

The selection menu is entered by pressing the 'Arrow' button and the following appears on the display:

S E L E C T I O N	+ -
INFORMATION	<--

By pressing the ‘Plus’ button, the menu item

S E L E C T I O N	+ -
SETTINGS	<--

Is selected. The selection menu is abandoned automatically if no button is pressed for more than 30 seconds.

By further pressing of the ‘Plus’ button, the following appears on the display

S E L E C T I O N	+ -
AGGREGATE TEST	
<--	

The test run is activated by pressing the ‘Arrow’ button and the function of the aggregates can be tested.
The displayed function or displayed unit is **switched on** by pressing the ‘Plus’ button.
The displayed aggregate is **switched off** by pressing the ‘Minus’ button.
One arrives at the **next test step** by pressing the ‘Arrow’ button.
The **test run can be ended prematurely** by pressing the ‘Plus’ and ‘Minus’ buttons simultaneously.

The displays, functions and aggregates to be tested can be seen in the ‘Short operating instructions for the lambda control’.

Commissioning

Instruction/commissioning/handover
Commissioning the control
Setting the boiler temperature

Instruction/commissioning/ handover
Following completion of the hydraulic and electrical installation, the boiler must be commissioned by a qualified specialist.

Ensure all parts are fitted in accordance with these instructions.

On completion of the installation allow a suitable period of time for any fire cement and mortar to dry out, before lighting the boiler. Once the boiler is under fire check all seals for soundness and check that the flue is functioning correctly and that all products of combustion are vented safely to atmosphere via the chimney terminal.

On completion of the installation and commissioning ensure that the operating instructions for the boiler are left with the customer. Please advise the customer on the correct use of the appliance and warn them to use only the recommended fuel for the boiler.

Advise the user what to do should smoke or fumes be emitted from the stove.
As part of the handover to the system user, a qualified specialist must explain the functions and operation of the boiler precisely in accordance with the installation and operating manuals. The commissioning protocol can be used as an aid.

Commissioning the control
After turning on the main heating switch on site, the power supply to the control is activated and a self-test of the control is carried out automatically.
After completion of the self-test the control is ready for operation. Alternately, the operating status and the boiler temperature appear on the display. In the event a malfunction is displayed after turning on the main heating switch, this must be fixed. (For precise information about this, please refer to the 'Troubleshooting' section).
The main heating switch should in principle remain switched on, since otherwise important monitoring and protective functions cannot be performed.
Following the combustion sequence, the control switches automatically to stand-by (energy efficiency function)

Setting the boiler temperature
Following the first commissioning of the control and the ensuing system settings by a professional, the following message appears on the text display:

Heating OFF

The Selection menu is entered by pressing the 'Arrow' button and the following message appears on the display:

S E L E C T I O N	+ -
INFORMATION	<--

The menu item 'SETTINGS' is selected by pressing the 'Plus' button. The following appears on the text display:

S E L E C T I O N	+ -
SETTINGS	<--

The selected menu item is confirmed by pressing the 'Arrow' button. The following appears on the text display:

Boiler set point	+ -
TK S [°C] ##	<--

The value can be changed by pressing the 'Plus' or 'Minus' button.
Setting range: 70 – 85 °C
(See **important instruction** – function description)
The changed value is saved by pressing the 'Arrow' button.
By pressing the 'Arrow' button once again, one will arrive via the next menu again to the text display:

Heating OFF

Commissioning the boiler

Heating up
During the initial commissioning, resp. after a long standstill, the following should be observed:
A 'cold' flue has no, or too little outlet pressure, so that in this case the exhaust fumes are poorly expelled. Heating up will be facilitated if you heat up the flue with paper through the cleaning hatch.
The following order of events must be adhered to when heating up the boiler:
- press the 'Add fuel' button. The following appears on the text display:

DO NOT OPEN! Please wait!

- the induced draft fan operates at high speed and the 'Add fuel' indicator blinks
- the door opener is released after 15 seconds and the following appears on the text display:

C A U T I O N OPEN SLOWLY!

Filling door 1 (centre) can now be opened.
Filling door 2 (top), the filling lid (60 L) and the ashes door remain closed!
- open the interior door using the operating hook
- switch off the induced draft fan by pressing the 'Minus' button, place 2 to 3 small dry split logs inside, cover with kindling wood, place paper and cardboard on top and **ignite from above**.
- switch on the induced draft fan again by pressing the 'Add fuel' button; the 'Add fuel' indicator blinks for 10 minutes
- close the interior door; the filling door remains open

Commissioning

Commissioning the boiler
Heating up/adding fuel

- wait until the control switches automatically to the operating mode ‘Heating ON’; the following appears in the text display:

Heating ON

and the ‘Heating ON’ indicator **lights up**.

- open the interior door
- place wood lengthwise inside the boiler, the logs parallel to each other (not crosswise or diagonally)
- close the interior door and the filling door
- If necessary, also place wood inside through filling door 2 or the filling lid (type 60 L). Press the ‘Add fuel’ button, then after 15 seconds:
- open filling door 2 and the interior door or the filling lid; the boiler can be filled to the top with wood
- close the interior door and filling door 2 or the filling lid

When the fuel has been used up, the control switches automatically into the operating mode ‘Heating OFF’ and the ‘Heating ON’ indicator **goes out**.

Adding fuel
As a matter of principle, more fuel should be added only if the fuel has been used up totally, when heating is required and the ‘Add fuel’ indicator **lights up**.

- **Pull and latch** the operating handle of the **gas vent flap**
- Press the ‘Add fuel’ button. The text display shows:

DO NOT OPEN! Please wait!

The induced draft fan operates at high speed and the ‘Add fuel’ indicator blinks for 10 minutes
- The door opener is released after 15 seconds and the text display shows:

C A U T I O N OPEN SLOWLY!

Filling door 1 (centre) can now be opened.
Filling door 2 (top), the filling lid and the ashes door remain closed!

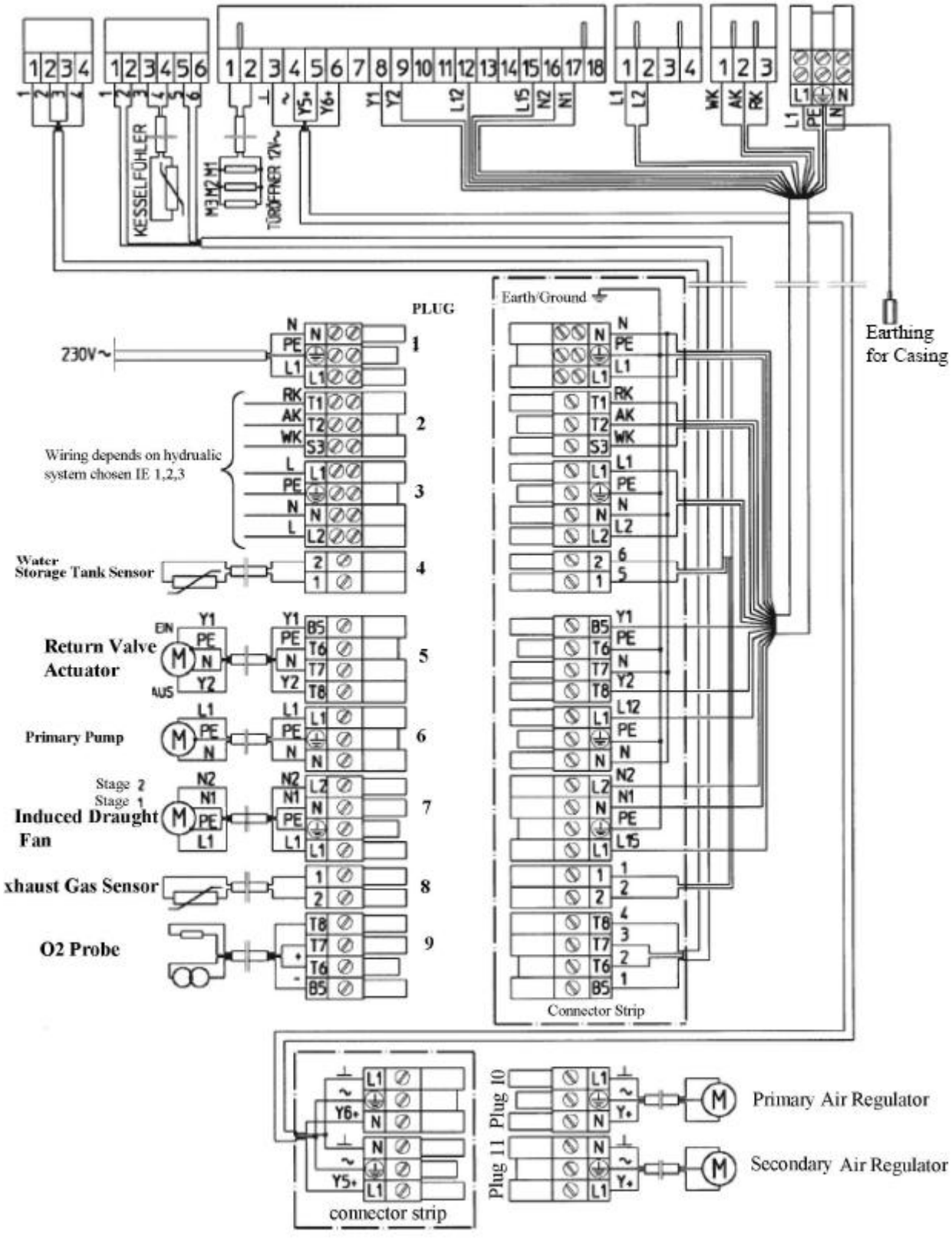
- Open the interior door using the operating hook
- Stir the fire bed to avoid the formation of voids
- Place wood lengthwise inside the boiler, the logs parallel to each other (not crosswise or diagonally)
- Close the interior door and filling door 1
- If necessary, also place wood inside through filling door 2 or the filling lid.
Press the ‘Add fuel’ button; open filling door 2 and the interior door or the filling lid after 15 seconds
- The boiler can be filled to the top with wood
- Wait until the control switches automatically to the operating mode ‘Heating ON’; the text display shows:

Heating ON

and the ‘Heating ON’ indicator **lights up**.
- Close the interior door and filling door 2 or the filling lid
- **Unlatch** the operating handle of the **gas vent flap and close the flap**.

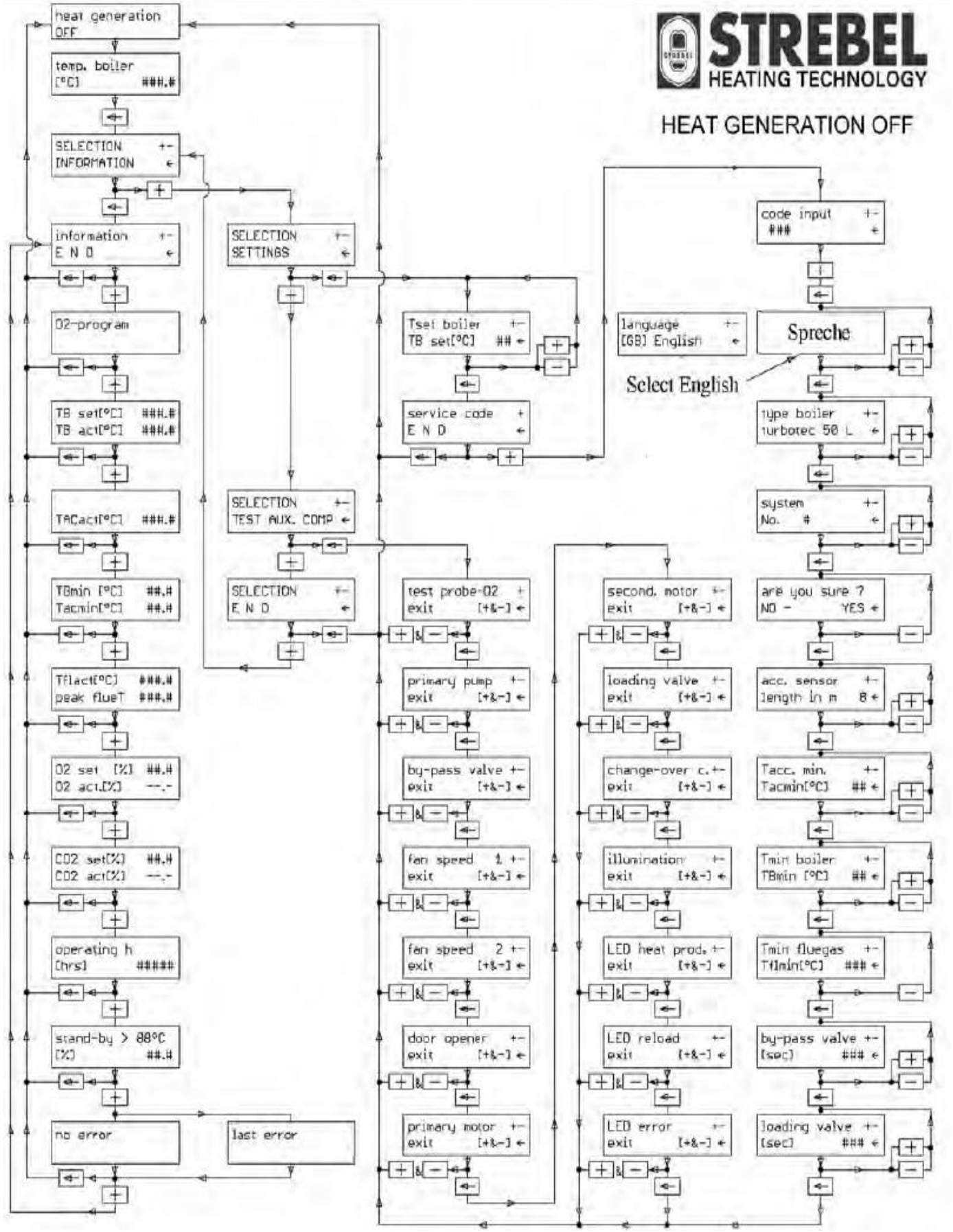
Commissioning

Circuit diagram

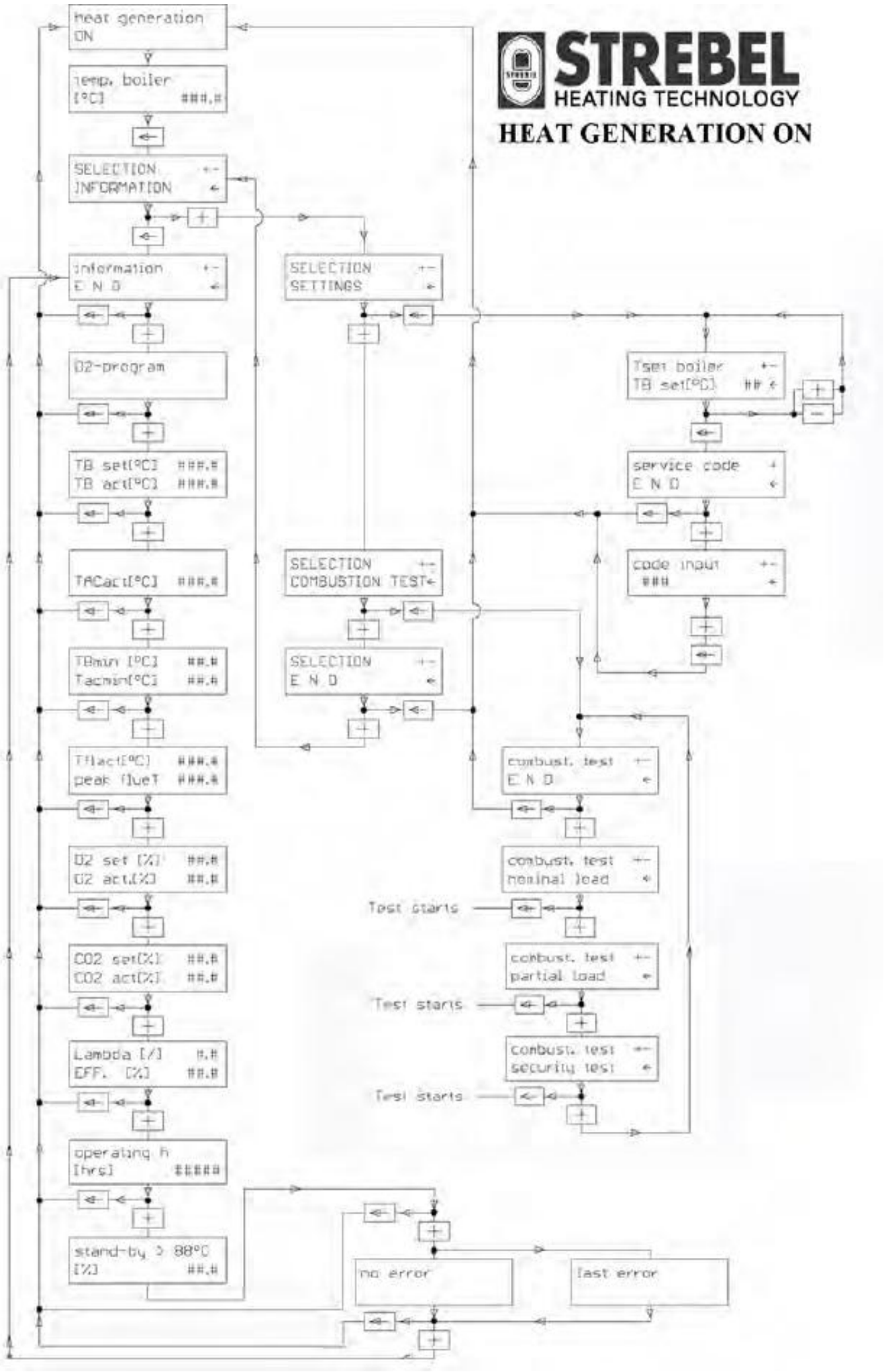


Deutsch	Englisch
KESSELFÜHLER	BOILER SENSOR
TÜRÖFFNER	DOOR OPENER
SCHUTZLEITER Kesselseitenwand	PROTECTIVE EARTH CABLE boiler side wall
SCHUTZLEITER Kesseldeckel	PROTECTIVE EARTH CABLE boiler lid
NETZ	MAINS
STECKER 1	PLUG 1
RK	NC
AK	NO
WK	COM
VERDRAHTUNG JE NACH SYSTEMANWENDUNG - HYDRAULIKSYSTEME 1-3	WIRING DEPENDS ON SYSTEM APPLICATION – HYDRAULIC SYSTEMS 1 - 3
SPEICHERFÜHLER	STORAGE TANK SENSOR
Wärmeeinnahme EIN	Heat absorption ON
STELLANTRIEB RÜCKLAUFVENTIL	RETURN VALVE ACTUATOR
Wärmeeinnahme AUS	Heat absorption OFF
PRIMÄRPUMPE	PRIMARY PUMP
Stufe 2	Stage 2
SAUGZUGVENTILATOR	INDUCED DRAFT FAN
ABGASFÜHLER	EXHAUST FUME SENSOR
Heizung	Heating
O2-SONDE	O2 PROBE
Sonde	Probe
STECKERLEISTE 1	CONNECTOR STRIP 1
PRIMÄRLUFTREGELEINHEIT	PRIMARY AIR REGULATOR UNIT
SEKUNDÄRLUFTREGELEINHEIT	SECONDARY AIR REGULATOR UNIT

Commissioning
Short operating instructions


STREBEL
HEATING TECHNOLOGY
HEAT GENERATION OFF
heat generation OFF
temp. boiler [°C] ###.#
SELECTION +- INFORMATION ←
information +- E N D ←
O2-program
TB set[°C] ###.# TB act[°C] ###.#
TACact[°C] ###.#
TBmin [°C] ##.# Tacmin[°C] ##.#
Tflact[°C] ###.# peak flueT ###.#
O2 set [%] ##.# O2 act.[%] --.-
CO2 set[%] ##.# CO2 act[%] --.-
operating h [hrs] #####
stand-by > 80°C [%] ##.#
no error
last error
SELECTION +- SETTINGS ←
Tset boiler +- TB set[°C] ## ←
service code + E N D ←
SELECTION +- TEST AUX. COMP ←
SELECTION +- E N D ←
test probe-O2 + exit [+&-] ←
primary pump +- exit [+&-] ←
by-pass valve +- exit [+&-] ←
fan speed 1 +- exit [+&-] ←
fan speed 2 +- exit [+&-] ←
door opener +- exit [+&-] ←
primary motor +- exit [+&-] ←
second. motor +- exit [+&-] ←
loading valve +- exit [+&-] ←
change-over c.+- exit [+&-] ←
illumination +- exit [+&-] ←
LED heat prod.+- exit [+&-] ←
LED reload +- exit [+&-] ←
LED error +- exit [+&-] ←
language +- [GB] English ←
Select English
code input +- ### ←
Sprache
type boiler +- turbotec 50 L ←
system +- No. # ←
are you sure ? NO - YES ←
acc. sensor +- length in m 8 ←
Tacc. min. +- Tacmin[°C] ## ←
Tmin boiler +- TBmin [°C] ## ←
Tmin fluegas +- Tflmin[°C] ### ←
by-pass valve +- [sec] ### ←
loading valve +- [sec] ### ←

Deutsch	English
Wärmeerzeugung AUS	Heating OFF
AUSWAHL	SELECTION
INFORMATIONEN	INFORMATION
ENDE	END
Regelprogramm	Control program
Winterbetrieb	Winter operation
Höchstwert	Highest value
Betriebsstunden	Operating hours
Bereitschaft	Standby
keine Störung	no malfunction
EINSTELLUNGEN	SETTINGS
SOMMERBETRIEB	SUMMER OPERATION
AGGREGATETEST	AGGREGATE TEST
Kesselsollwert	Boiler set value
Servicecode mit	Service code with
Test	Test
Sonde	Probe
Testende	End of test
Primärpumpe	Primary pump
Rücklaufventil	Return valve
Ventilator	Fan
Türöffner	Door opener
Primärmotor	Primary motor
Sekundärmotor	Secondary motor
Ladeventil	Charging valve
Heizkreispumpe	Heating circuit pump
Ladepumpe	Charging pump
Umschaltkontakt	Switchover contact
Beleuchtung	Lighting
LED Wärmeerz.	LED Heating ON
LED Nachlegen	LED Add fuel
LED Störung	LED Malfunction
CODE Eingabe	CODE input
Sprache	Language
Kesseltyp	Boiler type
System Nr.	System no.
Sind Sie sicher?	Are you sure?
NEIN	NO
JA	YES
Speicherfühler	Storage tank sensor
Länge in m	Length in m
Speichermax.	Storage tank max.
Speichermin.	Storage tank min.
Kesselmin.	Boiler min.
Abgastemp. min.	Exhaust fume temp. min.
Anzeige nur bei System 1	Display only for system 1
Anzeige nur bei System 1 und 2	Display only for systems 1 and 2


STREBEL
HEATING TECHNOLOGY
HEAT GENERATION ON
heat generation ON
temp. boiler [°C] ###.#
SELECTION +-
INFORMATION ←
information +-
E N D ←
SELECTION +-
SETTINGS ←
Tset boiler +-
TB set[°C] ## ←
service code +
E N D ←
code input +-
###
02-program
TB set[°C] ###.#
TB act[°C] ###.#
TAC act[°C] ###.#
SELECTION +-
COMBUSTION TEST←
SELECTION +-
E N D ←
TBmin [°C] ##.#
Tacmin[°C] ##.#
Tflact[°C] ###.#
peak flueT ###.#
combust. test +-
E N D ←
O2 set [%] ##.#
O2 act.[%] ##.#
combust. test +-
nominal load ←
Test starts
CO2 set[%] ##.#
CO2 act[%] ##.#
combust. test +-
partial load ←
Test starts
Lambda [/] #.#
EFF. [%] ##.#
combust. test +-
security test ←
Test starts
operating h [hrs] #####
stand-by > 88°C [%] ##.#
no error
last error

Deutsch	**English**
Wärmeerzeugung EIN	Heating ON
AUSWAHL	SELECTION
INFORMATIONEN	INFORMATION
ENDE	END
Regelprogramm	Control program
Winterbetrieb	Winter operation
Höchstwert	Highest value
Betriebsstunden	Operating hours
Bereitschaft	Standby
keine Störung	no malfunction
EINSTELLUNGEN	SETTINGS
SOMMERBETRIEB	SUMMER OPERATION
KAMINFEGERTEST	CHIMNEY SWEEP TEST
AGGREGATETEST	AGGREGATE TEST
Kesselsollwert	Boiler set value
Servicecode mit	Service code with
Nennleistung	Rated power
Teillast	Partial load
Sicherheitstest	Safety test
Test wird durchgeführt	Test is carried out
CODE Eingabe	CODE input
Anzeige nur bei System 1	Display only for system 1
Anzeige nur bei System 1 und 2	Display only for systems 1 and 2

Maintenance

Boiler maintenance Troubleshooting

Maintenance
(Heating to 'OFF')

Door closure bolts
The door closure bolts must be oiled regularly.

Sealing integrity of the doors
If smoke escapes through the doors, this is due to poor sealing caused by the sealing material yielding. The doors are adjustable on both the hinge and the closure sides and the sealing integrity can therefore be restored.

Sealing integrity of the gas venting flap
The gas venting flap must lay tightly against the frame for proper, low-emission operation.

Sealing integrity of the O_2 probe
The screw fitting of the O_2 probe must be checked for tightness (if necessary **carefully** retighten).

Safety devices
The reliability performance of the safety devices must be checked once a year by the heating installer or by another authorised person. The safety valve and the thermal discharge safety device must be checked. It is recommended to take out a service contract with a specialist firm!

Troubleshooting
The control recognises malfunctions automatically and executes malfunction-related alternative programs or safety measures.
There are two malfunction categories: the 'malfunction' indicator either **lights up continuously** or it **blinks**.

'Malfunction' indicator lights up continuously
In the case of the following malfunctions, the **continuation** resp. switching on of the heating function is **not** possible and the malfunction indicator is activated automatically:

Safety temperature limiter has tripped

STL tripped Reset!

Cause: boiler temperature is too high (no heat consumption, power failure, pump or valve defective). After the boiler temperature has dropped to approx. 80 °C due to heat consumption, the STL is reset by pressing the restart switch, thus automatically acknowledging the malfunction.

Measured values of the exhaust fume temperature are incorrect

Exhaust fume temperature Measured values wrong

Causes: plug contacts, sensor cable, control, exhaust fume sensor. After rectification of the malfunction it will be acknowledged by pressing the 'Arrow' button.

Measured values of the boiler temperature are incorrect

Boiler temperature Measured values wrong

Causes: plug contact, sensor cable, control,boiler temperature sensor. After rectification of the malfunction it will be acknowledged by pressing the 'Arrow' button.

Loss of control data

Data loss Control defective

Cause: data memory in the control is defective. The control must be repaired by the manufacturer.

'Malfunction' indicator blinks
In the case of the following malfunctions, the **continuation** resp. the switching on of the heating function respectively is **possible** until the malfunction has been rectified:
The malfunction message is shown on the text display in the operating mode 'Heating OFF' and after the 'Arrow' button is pressed:

Measured oxygen values are incorrect

Oxygen Measured values wrong

Causes: plug contact, probe cable, O_2 probe dirty/worn or screw fitting of the O_2 probe and protective tube is loose, control.
Check the O_2 probe by means of the aggregate test.
If the result of the aggregate test is 'Probe OK', then the malfunction is automatically deleted.
Important instruction:
Only perform the aggregate test if there is no fire or residual embers in the boiler.

Maintenance

Troubleshooting

Measured values of the storage tank temperature are incorrect

Storage tank temp. Measured values wrong

Causes: plug contact, sensor cable, control, storage tank temperature sensor.
After rectification of the malfunction it must be acknowledged by pressing the ‘Arrow’ button.

Boiler temperature too low

Boiler temperature too low [°C] ###

Causes: plug contact, cables, non-return valve, actuator, control.
After rectification of the malfunction it must be acknowledged by pressing the ‘Arrow’ button.

Exhaust fume temperature too high

Exhaust fume temperature too high [°C] ###

Cause: because of a too long fuel adding procedure or open gas vent flap, the exhaust fume temperature has exceeded 300 °C.
For rectification, refer to the operating manual.

Work on the electrical equipment may only be carried out by a specialist after disconnecting the installation from the mains!

Notes

ATTENTION!
IMPORTANT WARRANTY INSTRUCTION

Dear sir or madam,

We are delighted that you have chosen a Strebel Turbotec wood gas boiler.

This is a product of the highest quality, which stands out due to its numerous features designed for your convenience and safety, its durability and its high efficiency. A pioneer in wood gasification. In order to be able to use these advantages to the fullest extent, a conscientious commissioning of the boiler and comprehensive information about its operation are indispensable.

For this reason we have included with your boiler a ***commissioning protocol*** and would ask that you return this to us, having been filled in fully by a professional, *after completion of the commissioning, but at the latest within two months after delivery*. The boiler warranty will not become effective until we have received the completed protocol.

Please note: ***without this protocol, which confirms the proper handover and training of the user, we cannot give any warranty! Please contact Strebel to arrange commissioning or training by our own engineers, if required!***

We would like to thank you very much for placing your trust in Strebel, you will get many years of pleasure from your new boiler!

Strebel Ltd

Unit 1F Albany Park Industrial Estate, Frimley, Camberley
Tel: 01276 685422
Fax: 01276 685405
Email: info@strebel.co.uk

COMMISSIONING PROTOCOL

CUSTOMER NAME		**INSTALLER NAME**	
Street		Street	
Town/postcode		Town/postcode	
Tel. no.		Tel. no.	
Boiler type		Fax no.	
Serial no.		Carried out by	Mrs/Ms/Mr
Control no.		Date	
Signature		Signature	

HYDRAULIC AND SAFETY DEVICES	**OK**	**REMARK**
System assembled according to Strebel hydraulic diagrams		System no.: …….
Boiler and system vented, system pressurised, stop valves open		
Thermal discharge safety device connected (primary pressure 2 bar, valve sealed)		
3 bar pressure relief valve connected to boiler flow		
Expansion vessel approx. (5) – 10 % of total water volume		

FLUE	**OK**	**REMARK**
Flue diameter approx. equal to diameter of the exhaust fume nozzle, otherwise increase TAmin by 20 °C/diameter step		
Flue height ≤ 10 m, otherwise increase TAmin by 10 °C/m additonal flue length. Please note cold chimney draught.		
Flue exhaust fume path free, pipe connections sealed		
No other fireplaces connected to the flue		
No electrical cables or combustible parts in the exhaust fume pipe		

BOILER	**OK**	**REMARK**
Oxygen probe mounted with seal and tightened		
Air regulator units mounted tightly		
STL sensor and boiler temperature sensor with contact spring inserted fully into the boiler immersion sleeve		
Cleaning lid and doors tightly sealed		
Flame duct and ashes door linings OK		
Cast grating placed in position		
Drip tray removed from the boiler		

ELECTRICAL CONNECTION	**OK**	**REMARK**
Voltage supply 230 V with protective earth cable		
Electrical installation according to connection diagram		
Protective earth cable connected to boiler lid via spade connector		
Plugs latched in place at the rear side of the boiler and on the control		

COMMISSIONING		
Controller setting according to installation manual	**OK**	**REMARK**
Aggregate test carried out, whereby of particular importance are Lambda probe Return valve running direction Primary motor running direction, end position Secondary motor running direction, end position Charging valve running direction		
Test heating of boiler according to operating manual	**OK**	**REMARK**
Explanation of function and operation of the heating system whereby of particular importance are Cleaning the filling chamber floor Cleaning the grating support and the secondary air zone		

STREBEL
HEATING TECHNOLOGY

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Website: www.strebel.co.uk

E&OE - The company reserves the right to change the specification and dimensions without prior notice.

We are pleased to inform you that additional information and literature is also available on our website.www.strebel.co.uk